2012 VADEQ Citizen/Non-Agency Monitoring Activity Report

Since 2004, the number of stations monitored by citizen monitoring organizations, non-DEQ government agencies, private industries, and other monitoring groups has increased and much of the data collected have been incorporated into the bi-annual *305(b)/303(d) Integrated Water Quality Assessment Report* (Integrated Report). The latest 2012 Integrated Report contains the most citizen monitoring data to date.

Citizen Monitoring Group Activities:
One of the ways DEQ tracks citizen monitoring is to identify the number of groups that have Level III Quality Assurance (QA) status, the highest data quality.

Monitoring groups who receive Level III status must meet three conditions:

1. Pass a DEQ field or (when applicable) laboratory audit
2. Possess a DEQ approved Quality Assurance Project Plan (QAPP) and field or laboratory Standard Operating Procedures (SOP)
3. Provide calibration and other quality control information to DEQ. This information must meet the specific criteria stated in the QAPP

This makes Level III equivalent in data quality to samples collected by DEQ. Because of this, Level III data can be used to independently list or delist waters from the 303(d) Impaired Waters List. Table 1 lists the citizen volunteer groups which have Level III certification and the number of stations that were included in the 2012 Integrated Report.

Table 1- Level III Citizen Volunteer Organizations and Academic Institutions:

Citizen Group	Member Groups	Level III Sites*	Level III Parameters
Alliance for Chesapeake Bay	8	76	Dissolved Oxygen (DO), temperature
Chesapeake Bay Governors School	1	4	DO, pH, temperature
Clean Virginia Waterways	1	23	E. coli
Dividing Creek Association	1	48	DO, pH, temperature
Friends of Norfolk Environment	1	11	Enterococcus
Friends of the North Fork Shenandoah River	1	6	DO, E. coli, nutrients, pH, temperature
Friends of Shenandoah River (FOSR)	5	220	DO, E. coli, nutrients, pH, temperature
Goose Creek Association	1	23	pH, temperature
Historic Green Springs Inc.	1	7	DO, nutrients, temperature
Lake Anna Civic Association	1	32	DO, chlorophyll a, E. coli, pH, nutrients, temperature
Leesville Lake Association	1	12	DO, pH, temperature
McClure River Restoration Project	1	38	E. coli
National Committee for the New River	1	34	DO, temperature
Poquoson Citizens for the Environment	1	32	pH, temperature
Smith Mountain Lake Association	1	33	DO, E. coli, pH, temperature
StreamWatch	1	114	Benthic macroinvertebrates
Sweet Briar College	1	6	E. coli
Timberlake Homeowners Association	1	11	Chlorophyll a, DO, E. coli, nutrients, pH, temperature
Total	**28**	**724**	

* Stations with accurate site coordinates and located away from permitted discharges

In addition to the contributions provided by Level III monitoring groups, DEQ also works closely with monitoring groups that have Level II QA status.

QA Level II status is awarded to non-DEQ monitoring organizations that have a DEQ approved Quality Assurance Project Plan or QAPP. At this level, field or laboratory methods may deviate from DEQ recognized methods if it is demonstrated that the method provides similar quality data to an approved method.

Level II groups provide useful data to DEQ for identifying waterbodies for future DEQ monitoring and provide a generalized tracking efforts to implement Total Maximum Daily Loads. Table 2 lists the citizen volunteer organizations which supplied Level II data which was included in the 2012 Integrated Report. Level II data cannot be used by DEQ to list or delist waterbodies on the 303(d) Impaired Waters List. Level II data is used in the 305(b) assessment report to identify waterbodies which need or do not need follow up monitoring by DEQ.

Table 2- Level II Citizen Volunteer Organizations and Academic Institutions:

Citizen Group	Member Groups	Level II Sites*	Level II Parameters
Audubon Naturalist Society	1	8	Benthic macroinvertebrate
Blackwater/Nottoway Riverkeeper	1	14	DO, pH, temperature
Bull Run Mountains Conservancy	1	6	DO, pH, temperature
Cowpasture River Preservation Association	1	15	E. coli
Cubitt Creek Monitors	1	10	E. coli
Friends of Blacks Run Greenway	1	15	E. coli
Friends of Chesterfield's Riverfront	1	32	DO, E. coli, pH, temperature
Friends of Russell Fork	1	19	E. coli, temperature
George Mason High School	1	4	E. coli
Headwaters SWCD	1	12	E. coli
Hoffler Creek Wildlife Foundation	1	1	DO, pH, temperature
Isle of Wight Ruritan Club	1	3	DO, pH, temperature
John Marshall SWCD	1	33	E. coli
Lord Fairfax SWCD	1	12	E. coli
Loudoun Wildlife Conservancy	1	33	E. coli, macroinvertebrate
Mattaponi and Pamunkey Rivers Association	1	13	E. coli
Nelson County Master Gardeners	1	13	E. coli
Opequon Watershed Inc.	1	25	E. coli
Phi Theta Kappa- Blue Ridge Community College	1	2	pH
Potomac Appalachian Trial Club	1	7	Macroinvertebrate, pH, temperature
Prince William SWCD	1	12	E. coli
Randolph Macon College	1	12	E. coli
RappFLOW	1	20	E. coli
Riverine Chapter- Virginia Master Naturalists	1	6	DO, E. coli, pH, temperature
Rockfish Valley Foundation	1	6	E. coli
Save Little Pimmit Run	1	5	E. coli
Southside SWCD	1	20	E. coli
Smith Mountain Lake Association	1	75	Chlorophyll a, nutrients
Thomas Jefferson SWCD	1	11	E. coli
Upper Tennessee River Roundtable	1	9	E. coli
Virginia Save Our Streams	62	468	Benthic macroinvertebrate
Total	**93**	**930**	

* Stations with accurate site coordinates and located away from permitted discharges

Citizen Monitoring Grant:
For the FY2013 Citizen Monitoring Grant solicitation, DEQ received 20 applications totaling $130,310 in requests. Unfortunately, only $88,000 was available for awards. A three person panel reviewed applications and 13 applicants received funding. Grants will support volunteer based monitoring activities from January 1 through December 31, 2013. A final report from each recipient, including monitoring data, is due by February 15, 2014. **Appendix 1** contains more information about the FY2013 grant recipients. Applications were scored based on the size and scope of the project, collaboration with other monitoring organizations, and the ability to sustain monitoring beyond the grant year.

Citizen Monitored Stream Miles:
In 2002, the Virginia General Assembly passed legislation that established the Virginia Citizen Water Quality Monitoring Program in the Code of Virginia (§62.1-44.19:11). During the 2007 General Assembly, House Bill 1859 was passed that amended the Code as follows : "It shall be the goal of the Department to encourage citizen water quality monitoring so that 3,000 stream miles are monitored by volunteer citizens by 2010."

For the 2012 Integrated Report, DEQ determined that 3,887of stream miles of Virginia's surface waters were monitored by citizen monitoring groupsat either Level II or Level III QA. Additional streams were monitored at Level I, however Level I monitoring data cannot be used for 305(b) assessment. As a result, they were not included in the totals.

In addition to the nearly 3,900 stream miles monitored, citizen groups also monitored 29 square miles of estuaries and 30,737 acres of lakes and reservoirs. A list of Level II and III contributing organizations along with the mileage each group monitored is located in **Appendix 2**. Please note that some waterbodies were monitored by two or more organizations. To provide a reasonable measurement for each contributing group, the length or area of the waterbody with shared stations is averaged in proportion to the number of stations each group had in the waterbody. For example, if group A monitored two sites and group B monitored one site, group A received credit for 2/3 of the area and group B received 1/3.

Other Non-Agency Monitored Miles:
During the 2012 Integrated Report, DEQ also tracked the contributions by non-citizen monitoring organizations. These 'non-agency' submitters consist of other government agencies, private businesses, and other organizations that voluntarily provide monitoring data to DEQ.

Based on the data received for the 2012 Integrated Report, non-agency organizations provided data covering 639 stream miles, 28.9 square miles of estuaries, and 10,685 acres of lakes or reservoirs. **Appendix 3** of this report contains a list of contributing organizations and the mileage attributed to each group. As with the citizen data, some non-agency groups monitored the same waterbody segment as another citizen or other non-agency group. The same method of listing a proportional mileage based on the number of stations for each group in the segment was applied.

Citizen Nominations:
As required by Code of Virginia §62.1-44.19:5.F Water Quality Monitoring, Information and Restoration Act (WQMIRA), DEQ received nominations for 13 waterbodies in Virginia. Of the nominations received from January 1 through April 30 2012, DEQ will monitor at 12 waterbodies during the 2013 sampling year. Table 3 lists the nominated waterbodies that will be monitored by DEQ in 2013.

Table 3: Nominated Waterbodies Prioritized for DEQ Monitoring

County	Stream Name	Parameter	Name of Nominating Group
Appalachia	Callahan Creek	Selenium, total dissolved solids	Private Citizen
Appalachia	Looney Creek	Selenium, TSS	Private Citizen
Augusta, Rockbridge	Little Calfpasture River	Total Suspended Solids (TSS)	Private Citizen
Campbell	Waterlick Creek	Benthic macroinvertebrate	Private Citizen
Charles City County	Bradley Run	Dissolved Oxygen (DO), pH, conductivity, temperature	Private Citizen
Cumberland	Green Creek	DO, pH, conductivity, temperature, E. coli	Clean Virginia Waterways
Fairfax	Old Courthouse Spring Branch	DO, pH, conductivity temperature, nutrients, E. coli	Private Citizen
Fairfax	Wolf Trap Run	DO, pH, conductivity, temperature, nutrients, E. coli.	Private Citizen
Montvale	South Fork Goose Creek	DO, pH, conductivity, temperature	Private Citizen
Nelson	South Fork Rockfish River	E. coli	Rockfish Valley Foundation
Prince Edward	Gross Creek	Conductivity	Clean Virginia Waterways
Prince William	Ballywhack Creek	DO, pH, conductivity, temperature, nutrients, E. coli	Private Citizen
Prince William	Bull Run River	DO, pH, conductivity, temperature, nutrients, E. coli	Manassas National Battlefield Park

Water Quality Monitoring Survey Results

In the fall of 2012, DEQ conducted an online survey of monitoring groups to identify the needs and resources for organizations that submit water quality data to DEQ. The survey asked questions on the amount of monitoring conducted by groups, amount of staff or volunteer time to conduct the monitoring, and the financial and physical resources available to the groups. Below are the survey results.

Of the 34 respondents, they induced: citizen volunteer groups (15); colleges/universities (7); federal government (5); non-profit organizations (5), and local government (2). The survey determined that an average group had 1.2 paid staff who worked over 44 hours per month relating to water quality monitoring. The average hourly salary for the paid staff was $24.15/hr or $1,060.19 per month. Volunteers working for a group averaged 129.27 hours per month (13.9 volunteers working an average of 9.3 hours each per month). Assuming an hourly value of $22.60 for Virginia volunteers (www.independentsector.org/volunteer_time), volunteers provided an average of $2,921.50 per month in in-kind services per responding organization or nearly three times (2.76) the labor cost benefit compared to paid staff.

Respondents to the survey indicated they monitor a wide variety of water quality parameters. Among these parameters; field parameters such as dissolved oxygen and pH was the most widely sampled (25); followed by fecal bacteria such as E coli (22); followed by benthic macroinvertebrate sampling (19); 15 organizations monitored for nutrients; 13 sampled for turbidity; and 9 monitored a variety of other parameters such as dissolved metals. Of the 34 responding groups, 12 dropped off samples to a laboratory for analysis. Of these, eight groups operated their own laboratory.

The survey included several questions about the funding resources and operating budgets of groups. A budget allocation or grant/endowments is the primary source of funding for 20 respondents. In addition, five respondents relied on donations for the majority of their funding. Five other groups had no source of funding or paid out of their own pockets to continue operation. Finally, two organizations relied on membership dues to continue operations. The survey also determined that of 79% of respondents (26 of 33) who answered this section of the survey relied on this primary source of funding for over 70% of their budget.

The survey asked each group to provide an estimate of their annual operating budget. Most of the respondents (17) operated on less than $5,000. Six reported a budget between $5,000 and $20,000. Three indicated a budget of $20,000 to $50,000. Two had a budget of $50,000 to $100,000. Finally, one organization had an operating budget greater than $300,000 per year.

Questions were asked on the survey to see why groups monitor water quality. The majority of responses (13) stated they monitor water quality to identify areas of good or bad water quality. The next highest group (10) stated they monitor water quality to help educate the public about water quality. Three organizations monitored due to a specific concern such as urban development. Finally, two groups were monitoring as a way to advocate for the environment.

Finally, the survey asked which audiences did the groups share their data with and how it was communicated to the audience. The majority of responses (>80%) wanted to share their data with government officials, the public, and/or with members of their organization. The information was communicated using different methods. Nineteen of respondents reported they use an online database application like the DEQ Citizen/Non-Agency Database found at www.deq.virginia.gov/easi/; 17 groups shared data via a printed or online newsletter; 12 used PowerPoint presentations; nine shared their data in the form of a newsletter; five used E-mail or a website; and four organizations used radio/podcasts or other forms of communication. Finally, nearly every respondent (31 out of 32) indicated they either do or wish to share data with DEQ.

Appendix 4 contains summary tables of the above survey results.

Citizen/Non-Agency Monitoring Database:
The VADEQ Citizen/Non-Agency monitoring database at www.deq.virginia.gov/easi/ has been available since January 2008. As of December 2012, the database contains over 2,470 sample sites comprised of over 23,000 sampling events. Table 4 lists the groups who have accounts on the database.

Table 4: Monitoring Organizations with Accounts at www.deq.virginia.gov/easi/

Abingdon WWTP	John Marshall SWCD
Alliance for the Chesapeake Bay	Lake Anna Civic Association
Arlington County Four Mile Run Monitors	Leesville Lake Association
Blackwater/Nottoway Riverkeeper	Lord Fairfax SWCD
Central Blue Ridge Chapter of the Virginia Master Naturalists	Loudoun County
Chesapeake Bay Governor's School	Loudoun Watershed Watch
Chesapeake Beach Civic League	McClure River Restoration Project
Chesterfield County Office of Water Quality Protection	Nansemond River Preservation Project
Chesterfield Public Schools	National Committee for the New River
Chesterfield WaterTrends	Pocahontas State Park

City of Newport News	Poquoson Citizens for the Environment
City of Norfolk	Potomac Appalachian Trail Club
City of Suffolk	Prince William SWCD
Clean Virginia Waterways	Randolph-Macon College
Cowpasture River Association	RappFLOW
Dividing Creek Association	Riverine Chapter Virginia Master Naturalists
Edge Valley Preservation LLC	Roanoke Valley Chapter Trout Unlimited
Fairview Beach Residents Association	Rockfish River Monitors
Four Creeks Coliscan Monitors	Save Our Streams
Friends of Norfolk Environment	Smith Mountain Lake Association
Friends of Shenandoah River	Southside SWCD
Friends of Russell Fork	Thomas Jefferson SWCD
George Mason High School	Timberlake Homeowners Association
Goose Creek Association	Town of Dumfries
Historic Green Springs Inc.	Tye River Monitors
Isle of Wright Ruritan Club	United States Coast Guard Auxiliary Flotilla 33
James City County	University of Virginia

Public Outreach

The Water Quality Monitoring and Assessment Program (WMA) at DEQ have played an active role in participating in community events. Citizen monitoring organizations sponsored many of the events held throughout the Commonwealth. In 2012, WMA staff participated in 28 such events. **Appendix 5** provides additional details of these events.

Volunteer Monitoring Training

During 2012, DEQ staff participated in 19 monitoring training and technical assistance events with various water quality monitoring groups. Training and technical assistance to monitoring groups will continue to be a priority in 2013. **Appendix 6** lists these training events DEQ staff participated in during 2012.

Appendix 1: List of FY2013 Citizen Monitoring Grant Awardees

Name of Organization	Project Details	Parameters	Locality or Region	Award
Alliance for the Chesapeake Bay	Provide training of existing ACB volunteers. Maintain online database, purchase equipment, and related travel costs.	Temp, DO, pH, salinity, water clarity	Eastern Half of Virginia	**$12,000.00**
Arlington Dept. of Environment	Coordinate volunteer E. coli monitoring of Four Mile Run.	E. coli	Arlington	**$500.00**
Chesterfield Dept. of Environmental Engineering	Continue Level II volunteer monitoring efforts in Chesterfield County.	Temp, DO, pH, E. coli, Macroinvertebrate	Chesterfield	**$3,925.00**
Clarke County Planning Department	Monitor 10 springs in northern Shenandoah Valley for nutrients, E. coli, flow, and general water chemistry.	Temp, DO, pH, E. coli, flow, nutrients	Clarke and Frederick	**$4,000.00**
Dividing Creek Association	Provide volunteer training, purchase equipment and supplies, and expand monitoring coverage.	Temp, DO, pH, E. coli, salinity, turbidity	Northumberland	**$4,000.00**
Friends of the Shenandoah	Long term monitoring of the Shenandoah River covering 7 counties, 59 different watersheds and a drainage coving almost 3,000 sq. miles	Temp, DO, pH, E. coli, nutrients	Augusta, Clarke, Frederick, Page, Rockingham, Shenandoah, Warren	**$10,000.00**
Henricopolis Soil and Water Conservation District	Identify sources of E. coli on the Chickahominy River and its tributaries.	E. coli	Hanover and Caroline	**$1,700.00**
Historic Green Springs Inc.	Continued monitoring of the York River Watershed headwaters along the South Anna River.	Temp, DO, pH, nutrients, and turbidity	Orange, Louisa, Spotsylvania	**$1,875.00**
James River Association	Collect bacteria, turbidity and temperature samples on a weekly basis at 10 sites in the James River	E. coli, turbidity and Temp	Middle to lower James River Basin	**$3,925.00**
Lake Anna Civic Association	Continue Level II/III monitoring program on Lake Anna. Samples collected at 28 sites from April to October.	Temp, DO, pH, E. coli chlorophyll, nutrients	Orange, Louisa, Spotsylvania	**$4,000.00**
Lonesome Pine Soil and Water Conservation District	To continue monitoring along the McClure River and to raise citizen awareness and engagement in water quality issues.	Temp, DO, pH, E. coli	Dickenson	**$2,375.00**
Nansemond River Preservation Alliance	Monitor at seven sites along the Nansemond River f at seven sites.	Temp ,DO, pH, salinity, clarity	Suffolk	**$3,800.00**
National Committee for the New River	Continue and expand Level II/III monitoring program in the New River watershed.	Temp, DO, pH, E. coli, water clarity	Bland, Carroll, Floyd, Giles, Grayson, Pulaski, Wythe	**$2,600.00**
ODU NSTA Student Chapter	Work with high school students on sampling water quality using passive samplers to provide environmental toxicant data.	Pesticides, Polycyclic Aeromatic Hydrocarbons	Portsmouth	**$2,100.00**
Smith Mountain Lake Association	137 station Continue water quality monitoring program in Smith Mountain Lake from May to August of 2010.	Temp, DO, pH, E. coli chlorophyll, nutrients	Bedford, Campbell, Franklin	**$10,000.00**
The Northern Virginia Soil and Water Conservation District	Conduct training workshops using Virginia Save Our Streams protocols. Provide monitoring field trips for hundreds of students.	Temp. and macroinvertebrates	Fairfax	**$1,600.00**
Upper Roanoke River Roundtable	Train volunteers on the Virginia Save Our Stream protocol and educate the community about best management practices.	Macroinvertebrate	Smyth, Washington	**$3,600.00**
Virginia Save Our Streams/ Izaak Walton League of America, Inc.	Support SOS benthic macroinvertebrate monitoring in Virginia. Activities include training, review of monitoring data and database management.	Macroinvertebrate	Statewide	**$12,000.00**
Virginia Water Monitoring Council	Provide educational information about water monitoring and provide World Water Monitoring Day kits to the public.	N/A	Statewide	**$4,000.00**
			FY 2013 CMG Total funding	**$88,000.00**

Appendix 2: Mileage Contributions of Citizen Organizations (2012)

Group Name	Estuary Mile^2	Reservoir Acres	River / Stream Miles
Alliance for the Chesapeake Bay	19.714		98.48
Audubon Naturalist Society			13.19
Blackwater/Nottoway Riverkeeper			455.74
Bull Run Mountains Conservancy			12.6
Central Virginia Governor's school			7.22
Clean Virginia Waterways / Longwood University			60.06
Cowpasture River Preservation Association			91.18
Cubbitt Creek Monitors	0.227		
Dividing Creek Association	2.035		3.89
Elizabeth River Project	4.999		
Friends of Blacks Run Greenway			13.94
Friends of Chesterfield's Riverfront	0.501	88.37	36.89
Friends of Norfolk Environment	0.027		
Friends of Russell Fork			28.71
Friends of the North Fork Shenandoah River		40.95	13.15
Friends of Shenandoah River		0.74	671.1
George Mason High School			2.94
Headwaters SWCD			70.22
Historic Green Springs Inc.			33.82
Hoffler Creek Wildlife Refuge	0.057		
Isle of Wight Ruitian Club			8.28
John Marshall SWCD			67.57
Lake Anna Civic Association		9,567.78	11.98
Leesville Lake Association		717.57	
Loudoun Wildlife Conservancy			86.88
Mattaponi Pamunkey Rivers Association	0.58		40.15
McClure River Restoration Project			72.78
National Committee for the New River			144.85
Nelson County Master Gardeners			67.5
Phi Theta Kappa (Blue Ridge Community College)			2.06
Poquoson Citizens for the Environment	0.322		46.9
Potomac Appalachian Trail Club			20.56
Prince William Soil and Water Conservation District	0.543	109.77	30.13
Randolph Macon College			30.13
RappFLOW			15.28
Riverine Chapter Virginia Master Naturalist			55.52
Rockfish Valley Foundation			7.7
Save Little Pimmit Run			1.85
Smith Mountain Lake Association		16,623.02	38.93
Southside Soil and Water Conservation District			129.24
StreamWatch			306.43
Sweet Briar College			12.79
Thomas Jefferson Soil and Water Conservation District			51.59
Timberlake Homeowners Association		56.96	4.93
Upper Tennessee River Roundtable			14.53
VA Karst			7.46
Virginia Save Our Streams		3,531.63	998.08
Citizen Total	**29.005**	**30,736.79**	**3,887.23**

Appendix 3: Mileage Contributions of Non-Citizen Organizations (January 2005 - December 2010)

Group Name	Estuary Mile[2]	Reservoir Acres	River / Stream Miles
Abingdon Sewage Treatment Plant			3.29
Chesterfield County Dept of Environmental Engineering		1,049.46	174.49
City of Newport News Waterworks			27.12
City of Norfolk Dept of Public Utilities		3,443.80	
Cumberland Resources Corporation			7.94
Edge Valley Preservation LLC			15.27
National Park Service- Richmond Battlefield Parks			44.11
National Park Service- Shenandoah National Park			44.18
Occoquan Watershed Monitoring Laboratory		1,250.50	
Page County Department of Environmental Services			42.77
Tennessee Valley Authority		1,699.32	
United States Environmental Protection Agency	1.23		3.02
United States Fish and Wildlife		3,241.96	62.86
United States Forest Service			124.59
United States Geological Survey			36.85
University of Virginia			52.42
Virginia Department of Health- Beach Monitoring Program	27.63		
Non-Agency Total	**28.86**	**10,685.04**	**638.91**

Appendix 4: Water Quality Monitoring Survey Results

General Background Information		
1. What term best describes the water quality monitoring group you belong to?	Citizen Volunteer	15
	College/University	7
	Federal Government	5
	Non Profit/ NGO	5
	Local Government	2
2. How many sites are monitored during a typical year?	Sum of survey responses	880
	Average number of sites from responses	26.67
	Median number of sites from responses	15
	Minimum number of sites from responses	1
	Maximum number of sites from responses	180
3. Which parameters does your water quality monitoring group sample for? (Check all that apply)	Field Parameters	25
	Bacteria/ E Coli	22
	Benthic Macroinvertebrates	19
	Nutrients (nitrogen, phosphorus, etc.)	15
	Water Clarity/Turbidity	13
	Other	9
4. Does your monitoring group drop off samples to a laboratory for testing?	Yes	12
	No	22
5. If yes, is the laboratory operated by the monitoring group or is it a contracted laboratory?	Lab operated by the monitoring group	8
	Contracted Laboratory	4
Budget and Operation Costs		
6. How many paid staff positions work for the group?	Sum of paid staff positions	39
	Average number of paid staff positions	1.2
	Median number of paid staff positions	0.5
	Minimum number of paid staff positions	0
	Maximum number of paid staff positions	13
7. Average number of hours per month a paid position works relating to water quality monitoring?	Sum of paid hours from survey responses	643
	Average number of hours from responses	37.18
	Median number of hours from responses	30
	Minimum number of hours from responses	5
	Maximum number of hours from responses	175
8. Hourly wage and benefits for a paid monitoring position?	Sum of survey responses	$265.68
	Average hourly wage and benefits	$24.15
	Median hourly wage and benefits	$25.00
	Minimum hourly wage and benefits	$ 1.00
	Maximum hourly wage and benefits	$48.08
9. How many unpaid positions (e.g. volunteers) work for the group?	Sum of survey responses	439
	Average number of unpaid positions	13.88
	Median number of unpaid positions	5.5
	Minimum number of unpaid positions	0
	Maximum number of unpaid positions	100
10. Average number of hours per month a nonpaid position works relating to water quality monitoring?	Sum of survey responses	232
	Average number of unpaid hours	9.28
	Median number of unpaid hours	5
	Minimum number of unpaid hours	0
	Maximum number of unpaid hours	75
11. What is the estimated annual budget for water quality monitoring conducted by the group?	$0-$1,000	9
	$1,000-$5,000	8
	$5,000-$20,000	6
	$20,000-$50,000	3
	$50,000-$100,000	2
	$100,000-$300,000	2
	>$300,000	1

Budget and Operation Costs Continued		
12. What is your water quality monitoring group's primary source of income to cover operating costs?	Budget Allocation	10
	Grants/ Endowment	10
	Donation	5
	No Funding Source	5
	Membership Dues	2
13. How much does the primary source of income cover operating expenses?	100%	13
	90%	4
	80%	3
	70%	6
	60%	3
	≤50%	4
14. What is the secondary source of income to cover monitoring costs?	No Funding Source	13
	Grants/Endowment	7
	Budget Allocation	3
	Donations	3
	Membership Dues	2
	Selling services	2
	Other	4
15. How much does the secondary source of income cover monitoring expenses?	50%	1
	40%	0
	30%	7
	20%	5
	10%	6
	0%	13
Purpose of Monitoring/Data Sharing		
16. What is the main reason why the group is monitoring water quality?	Identify areas of good or bad water quality	13
	Education and outreach of public	10
	Response to a specific concern	3
	Advocate for the environment	2
17. Who is the intended audience for water quality data collected by the group? (Check all that apply)	Government officials	26
	General Public	25
	Members of the group	24
	Academic peers	11
	Local Partners/Schools	4
18. How is waster quality data communicated to the intended audience? (Check all that apply)	Database application	19
	Newsletter	17
	PowerPoint	12
	Research Paper	9
	Email/Website	5
	Radio/Podcast	1
	Other	3
19. Does your group submit water quality data to VADEQ?	Yes	24
	No	8
20. If yes, is any of the submitted data considered Level III by the Virginia DEQ?	Yes	17
	No	3
	Do not know	4
21. Is your group interested in submitting data to the Virginia DEQ?	Yes	31
	No	1

Appendix 5: Public Outreach Events

February 16: Lucille Brown Middle School Science Fair Extravaganza- Richmond, VA. DEQ staffs participated with students and parents of this school at a science fair project.

March 19: Envirothon Judging- Henrico, VA. Agency staff participated in judging the Henricopolis Soil and Water Conservation District Envirothon event. The winners moved on to the Area III Envirothon event held in April.

April 14: Blacks Run Downtown/Clean-up Day- Harrisonburg, VA. Co-coordinator of the "Green Scene" Educational Expo, DEQ manned a Touch Tank of Stream Life.

April 16: Rainbarrel Workshop- Harrisonburg, VA. DEQ staffs assisted with SVSWCD rainbarrel workshop, including a summary presentation about local water quality with the Harrisonburg citizens.

April 20: Greenfield Elementary Earth Day Celebration- Richmond, VA. DEQ staffs participated at the Earth Day Celebration at this school. Parents decided the topic of discussion for their children.

April 23: Abingdon Women's Club- Abingdon, VA. Abingdon field office staff gave a presentation at the meeting on water conservation.

April 25: Area 1 Envirothon. DEQ staffs acted as the judges for the aquatics segment of the event. Staff also wrote and administered area aquatics test.

April 29: Event at Forest Hill Park. DEQ staffs participated along with 50 other people.

April 30: Eight National Monitoring Conference- Portland, OR. Agency staff gave multiple presentations on water quality initiatives including the partnerships the agency has with citizen volunteer organizations. The DEQ presentations had a total of approximately 200 people in the audience.

May 1: Kiwanis Club Meeting- Harrisonburg, VA. DEQ staffs gave a presentation on local water quality.

May 18: Virginia Water Monitoring Council annual conference. DEQ employees presented a theme "Water Quality Monitoring: New and Innovative Techniques."

May 21: DEQ employees acted as Aquatic Judge: Assisted with writing and administering aquatics test.

May 25: Trout in the Classroom Release for Skyline Middle School- Harrisonburg, VA. DEQ staffs Co-led the water chemistry station with Jared Purnhagen.

May 30: Boxerwood Stream Day. DEQ staffs led macros station for Natural Bridge Middle School.

June 1: Mountain View Elementary School's Dry River Environmental Day. DEQ employees presented a Chemical monitoring station.

July 28: Virginia FFA Environment & Natural Resources Competition.

August 13-18: Rockingham County Fair- Rockingham County, VA. Coordinated DEQ Tent with the SVSWCD/NRCS Conservation Cabin, incl. working one night with Shenandoah River Jeopardy.

August 28: Sunday in the park- Foresthill Park, Richmond, VA.

August 21: Broadway-Timberville Ruritan Breakfast Meeting, Timberville, VA. DEQ staff gave a presentation on local water quality.

September 10: Watershed Walk 2011. Theme was "From Your Shed to Our Watershed", sponsored by Eastern Shore Soil and Water Conservation District Environmental Education Council", to show what your organization is doing to protect the Chesapeake Bay and the Eastern Shore Watershed.

September 19: World Water Monitoring Day: Haines Point on the Potomac River - Washington, DC. DEQ staffs and students from local schools participated in monitoring activities, as well as displays and other hands on activities.

September 26: Plant a seed- Harrisonburg, VA. DEQ staffs led the hydrology station for Hburg 6th graders.

September 28 to October 7: River Day 2011 at Sandy Point?. Display on River Talk and Macroinvertebrate discovery; Over 12,000 citizens visited this exhibit; 36 volunteers for total 19 shifts (5 hour shift).

September 29 to October 6: State Fair- Doswell, VA. DEQ employees manned an exhibit on benthic macroinvertebrates and explained how they are good indicators for water quality.

October 3: Plant-A-Seed- Harrisonburg, VA. DEQ staffs led the hydrology station for Harrisonburg 6th graders.

October 9: Boxerwood Stream Day. DEQ led Macros station for Buena Vista Middle School.

October 24-26: State Environmental Education Conference, Rural Retreat, VA. Abingdon field office staff assisted with the conference.

October 27: Virginia Citizens for Water Quality Summit, Ashland, VA. Headquarters staff presented at the conference and lead a workshop training session.

Appendix 6: Volunteer Monitoring Training

1. **Coliscan Easygel Training.** As part of the DEQ commitment to support volunteer monitoring, the agency provided equipment and training on the use of the Coliscan Easygel™ method to detect E. coli bacteria. As part of the training, groups agreed to share their data with DEQ. The agency will use the data to track bacteria levels in the monitored watersheds. Below is a list of training events with groups who participated in the effort.

    a. **January 10: Arlington County Four Mile Run Monitors.** Training provided to new and returning volunteers to monitor Four Mile Run in Arlington County.
    b. **July 21: StreamWatch.** Training to conduct Coliscan monitoring in the Rivanna River watershed in Albemarle County.
    c. **July 28: Engineers Without Boarders, Montgomery College Student Chapter**. Provided training to use Coliscan to monitor drinking water quality for use in Belize
    d. **September 6: Friends of Byrd Park.** Trained new volunteers to monitor for E. coli at several ponds located in the park.
    e. **October 27: Virginia Citizens for Water Quality Summit.** Conducted a workshop training session of 14 volunteers from around the state on how to use Coliscan Easygel.
    f. **November 7: Tye River Monitors.** Conducted training of using Coliscan Easygel in several streams along the Tye River.
    g. **December 15: Green Aquia Monitors.** Training provided to begin monitoring several small waterbodies in Stafford and Prince William Counties.

2. **January 17: Online Database Training.** Conducted a training session on using the DEQ Citizen Volunteer/ Non-Agency Database located at www.deq.virginia.gov/easi/.

3. **January 28: Alliance for the Chesapeake Bay.** Assisted the Alliance for the Chesapeake Bay to train volunteers in the Newport News area.

4. **February 23: James River Master Naturalists.** Assisted the Alliance for the Chesapeake Bay to train volunteers in Powhatan County.

5. **March 24: Dividing Creek Association.** Validated accuracy of monitoring equipment in Kilmarnock, Virginia.

6. **April 13: Lake Anna Civic Association.** Inspected and verified accuracy of field monitoring equipment in Spotsylvania County.

7. **April 23: Occoquan Water Monitoring Laboratory.** Conducted a review and toured the facility in Manassas, Virginia.

8. **May 10: McClure River Restoration Project.** Conducted an audit and training for methods used in Dickenson County.

9. **May 11: Wolf Creek Wastewater Treatment Facility.** Inspected and verified accuracy of water quality equipment used to monitor Wolf Creek as part of a voluntary monitoring initiative.

10. **June 1: Biological Monitoring Inc.** Conducted audit of benthic monitoring program prior to submission of benthic data to DEQ.

11. **July 11: Ferrum College/Smith Mountain Lake Association.** Reviewed Ferrum College laboratory facilities and field procedures in processing samples for the Smith Mountain Lake Association monitoring program. Validated accuracy of field and laboratory thermometers.

12. **August 9: Friends of the Shenandoah River.** Conducted a laboratory audit and inspected the monitoring equipment used in the Shenandoah watershed.

13. **October 12: McClure River Restoration Project.** Conducted an inspection of the laboratory facilities used for E. coli analysis. Verified the accuracy of the laboratory thermometers and provided guidance on testing procedures. Inspection occurred in Dickenson County.